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Consultation Paper

TELECOM INFRASTRUCTURE SHARING GUIDELINES

STRATEGY & DEVELOPMENT DIVISION

Pakistan Telecommunication Authority

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1 Introduction

Section 7.5 of the Telecom Policy 2015 mandates PTA to develop the necessary regulatory instrument to encourage, facilitate and standardize infrastructure sharing in consultation with Federal Government (MoIT&T) and stakeholders. To this effect infrastructure sharing guidelines are being developed by PTA based on the principles of neutrality, non-discrimination and equal access. The guidelines will provide a mechanism for licensees and other stakeholders to share their telecom and other infrastructure facilities that would include space, electrical power, air conditioning, security, cable ducts, space on antenna and towers, etc. The infrastructure sharing (active and passive) guidelines will take into account international best practices and will provide a framework for telecom industry to facilitate Telecom Infrastructure Sharing.

Telecom infrastructure sharing is a broad range term that generally refers to sharing of telecom network components and associated non electronic and physical infrastructure. Telecom network can broadly be divided into two major areas namely ‘Inside Plant (ISP)’ and ‘Outside Plant (OSP)’. Inside plant comprise of network components such as Core Network (CN), charging / billing systems, intelligent network, application servers for VAS, content delivery network, data centers, transport network management components, etc. (such as ADM, DWDM). Outside plant mainly comprises of Access Network that involves cable as well as Radio Access Network (RAN) and associated civil infrastructure involved to support deployment of access network such as towers, masts, cable ducts / utility corridors, space for collocation of different types of telecom related equipment, etc.

Infrastructure sharing concept promotes resource optimization by better utilization of assets, avoiding duplication of network, saves time and cost in network and service rollouts. Telecom network deployment involves heavy CAPEX and OPEX liabilities for operators and is considered as a major deterrent for network roll-outs. Furthermore, delays in rolling out new network infrastructure, which are attributed to procuring rights of ways, pose great challenges to licensed operators in terms of time relevance to market for telco and ICT services. Infrastructure sharing enables operators to focus on the competition in the service layer regardless of the extent of the sharing. Operators can share whole or strategically unimportant parts of its infrastructure to share infrastructure costs while providing acceptable performance. Furthermore, these savings can facilitate mobile operators’ migration to next-generation technologies.

1.1 Types of Infrastructure Sharing

Infrastructure sharing can be categorized into two (2) broad categories i.e. a) Active Infrastructure Sharing, and (b) Passive Infrastructure Sharing.

1.2 Active Infrastructure Sharing

Active infrastructure sharing involves sharing the electronic network elements – energized network elements – embodied in mobile and fixed networks, core and access nodes, Operational Support System (OSS), Business Support System (BSS) and elements involved in management of transport network including fiber and radio network elements. For the purpose of this document / guidelines it excludes radio frequency spectrum sharing and trading.

1.3 Passive Infrastructure Sharing

Passive infrastructure sharing means sharing of non-electronic infrastructure such as physical sites, buildings, premises, tower / masts, power supply (including battery, diesel gen-set any alternate means), air-conditioning etc. For the purpose of this document / guidelines it excludes cable ducts / utility corridors owned by non-licensed telecom operators or other utility infrastructure owners.

1.4 Drawing Boundaries - Active and Passive Infrastructure Sharing

Due to complex nature and models involved in infrastructure sharing, active sharing includes most of passive infrastructure components, therefore, boundaries between the two types are often confused. Following figures (figure 1 & 2) provide a high level of understanding to draw boundaries between active and passive elements for mobile and fixed networks infrastructure.

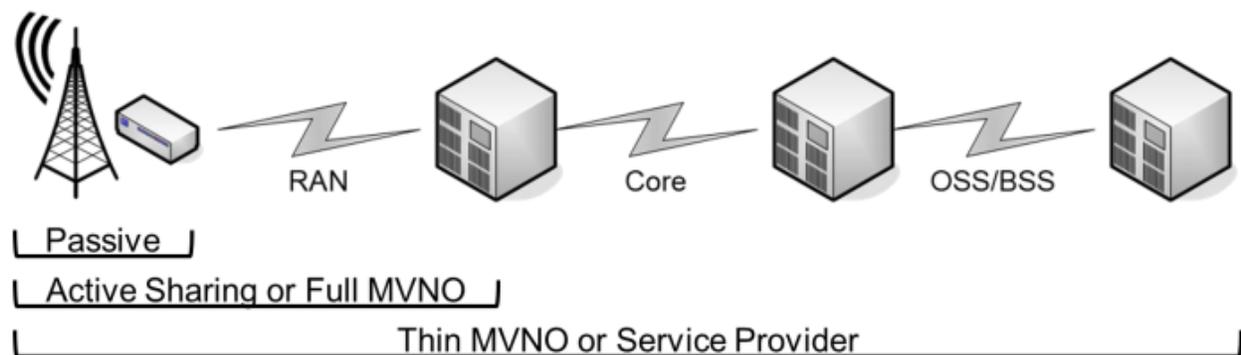


Figure1: Mobile Network Infrastructure Sharing

Passive sharing: Sharing of non-electronic infrastructure such as: sites, towers, poles, ducts, trays, shelters, equipment rooms, power, HVAC, security, etc.

Active sharing: Sharing of active (i.e., electronic) infrastructure in a RAN or fixed access network; see the following definitions for antenna sharing, MORAN and MOCN for specific cases of active sharing.

Antenna sharing: Passive sharing but including the antennas, feeders, amplifiers and combiners.

MORAN (Multi-Operator RAN) sharing of active (i.e., electronic) infrastructure in a RAN such as the BTS/BSC, Node B/RNC, eNode-B, etc.

MOCN (Multi-Operator Core Network) as “MORAN” but the spectrum is also shared

MVNO (Mobile Virtual Network Operator) an operator licensed to use the RAN and spectrum of another operator; the MVNO does not hold a spectrum license and may or may not own a core network.

Roaming: users from one Cellular Mobile Operator (CMO) are able to access the network of a second CMO within the same country; usually limited to a geographical area; for the purpose of this document international roaming is excluded

Transmission sharing: Sharing of the backhaul or backbone transmission network including equipment such as: microwave, fiber optic cable, terminating equipment, routers, etc.

GWCN (Gateway Core Network) sharing: Sharing of a mobile core network including equipment such as MSCs and SGSNs.

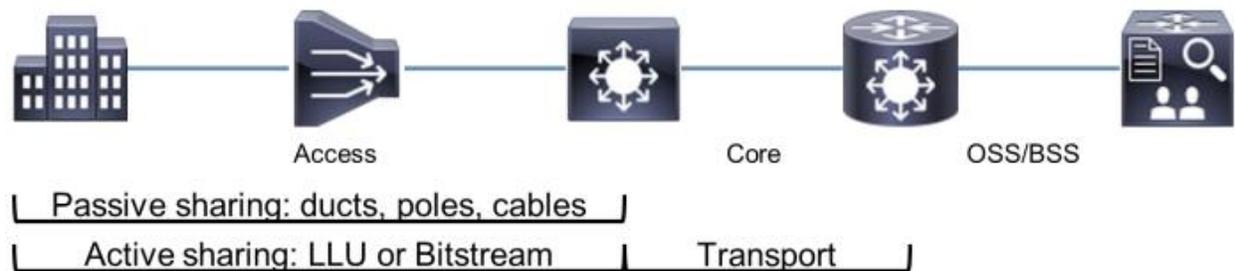


Figure2: Fixed Network Infrastructure Sharing

Passive sharing: Sharing of non-electronic infrastructure such as: sites, towers, poles, ducts, trays, shelters, equipment rooms, power, HVAC, security, etc.; in fixed network sharing the “local loop” cabling (copper, coax or fiber optic) is treated as part of the passive infrastructure

LLU (Local Loop Unbundling): Use of a fixed access network operator’s physical connection between a local exchange and the customer’s premises to deliver services by another operator; partial unbundling is where the network operator retains the voice services and the second operator takes over the data services

Bit stream access: Provision by one fixed access network operator to another of xDSL service between the customer’s premises and a handover point

OAN (Open-Access Network): OAN operator allows multiple telecommunications service providers to deliver services over its network; the OAN operator does not compete with the service providers.

2 Global Practices

2.1 Infrastructure Sharing Business Outlook

The scope of sharing opportunities ranges from network elements like ducts, poles, tower, and masts, to dark fiber (unused fiber-optic cable) and frequency spectrum. Telecom operators are employing various forms of infrastructure sharing, with different implications in terms of risk sharing, access, ownership, and funding. The most common of these is the sale and leaseback structure. Under this structure, mobile operators sell towers to an independent tower company. The towers are then leased back to the operator as well as other operators with whom the tower company has a relationship. The tower company is then responsible for the operation and maintenance of the tower. The Tower Co model is developing globally, and is gaining traction across a range of emerging economies. Africa, South America, Myanmar and Indonesia are leading the way in the current environment, as operators and governments align their interests in utilizing and encouraging such models. The nature of activity in each market depends on the stage of development of the same. In new markets, acquisitions and divestments and loan financing of the same will dominate the landscape, however in those markets where the model and Tower Cos

themselves are more established with diversified portfolios than bond financings and corporate activity, whether Mergers & Acquisitions (M&A) or Initial Public Offering (IPO), are expected to be more common.

Vertically integrated network operators (i.e., those that own the network and offer retail services) can create a joint venture to pool their capital resources to finance a fiber optic network or a tower company. Examples include Indus Towers in India, a joint venture between Bharti Airtel, Vodafone, and Idea; and a duct sharing agreement between Neotel (Liquid), MTN, and Vodacom in South Africa to deploy their transmission network.

So far, shared digital infrastructure remains limited and several emerging markets are lagging (Figure 3). At the global scale, an estimated 70 percent of countries reported mandated infrastructure sharing, and just 44 percent in the Asia-Pacific region, the lowest among regions worldwide. Sharing of mobile network elements, including towers and spectrum, is rising but at a slow pace. Over the past 10 years, only 10 active network sharing agreements have been announced across the Middle East and Africa region. Countries including Algeria, Ethiopia, Senegal, Morocco, Zimbabwe, Bolivia, Philippines, the Lao People’s Democratic Republic, and Nepal have virtually no independent tower company. Fixed broadband network sharing, whereby incumbent operators provide access to their last-mile network to competitors, is virtually absent in most emerging markets. Beyond broadband infrastructure, data centers can also be shared. Most large companies with sensitive customer data—banks, healthcare firms, telecoms companies, and government agencies, for example—can share building, connectivity, and power by housing their IT infrastructure with an independent data center operator. Likewise, medium and small businesses can take advantage of cloud based services to store and process their digital data on remote IT infrastructure without incurring the costs of installing and maintaining their own data centers. Data centers require high-quality connectivity and can also benefit from shared Broadband infrastructure.

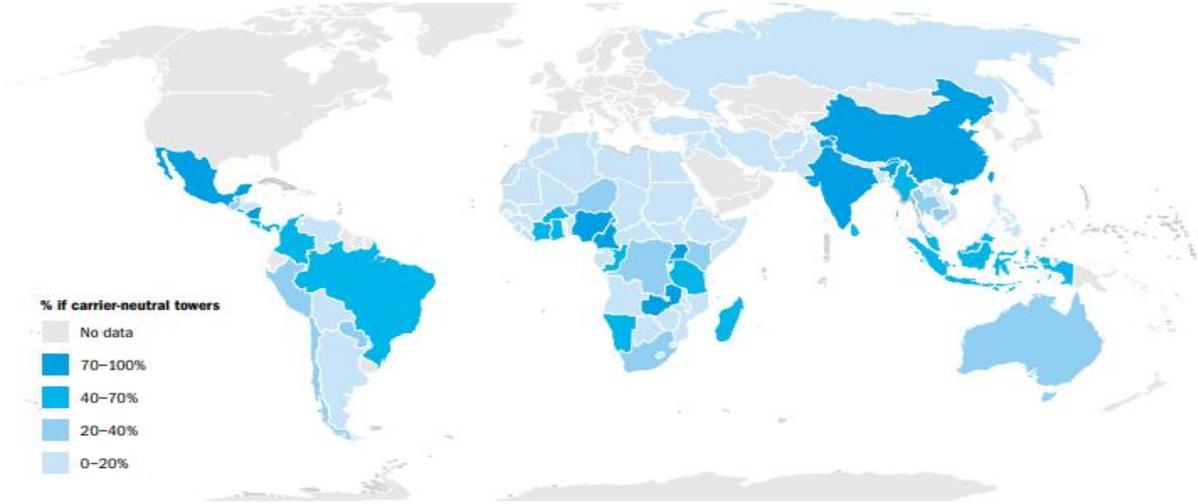


Figure3: Tower sharing through independent companies in selected markets, Geographic boundaries are only for illustration purposes.

2.2 Infrastructure Sharing Regulatory Regimes

2.2.1 India

Telecom Regulatory Authority of India (TRAI) issued a consultation paper on the “Review of Scope of Infrastructure Providers Category-I (IP-I) Registration” in August 2019. To discuss infrastructure sharing, TRAI invited stakeholders’ comments and conducted an open house discussion. Based on stakeholders’ written submissions, issues discussed in the open house and its own analysis, TRAI has released its recommendations on enhancing the scope of IP-Is.

TRAI stopped short of recommending spectrum sharing, and Active infrastructure sharing has been permitted amongst Telecom Service Providers (TSP) licensees only. Active sharing is limited to sharing of antennas, feeder cables, Node B, Radio Access Network (RAN) and transmission system, excluding sharing/trading of radio spectrum. IP-Is can also install all these active elements but only on behalf of TSPs.

However, sharing of active infrastructure among TSPs has not been very effective. As TSPs operating in the same geographical area and providing similar telecom services are competitors as well, some TSPs are not willing to share their resources with competitors, if it leads to a competitive disadvantage. Therefore, mutual agreements between TSPs are not successful. Alternatively, TSPs are reportedly more comfortable in leasing telecom infrastructure from a non-competing entity such as an IP-I. This has dual benefits of enabling TSPs to concentrate on their core competency of providing telecom services and allowing IP-Is to invest and create active as well as a passive telecom infrastructure.

2.2.2 Bangladesh

In Bangladesh, at present passive sharing is promoted through the ‘Guidelines for Infrastructure Sharing’. These guidelines were issued in 2008 and amended in 2011. They only allow Passive infrastructure sharing for now. Active infrastructure sharing is not yet approved. Bangladesh Telecom regulatory Authority (BTRC) is working to prepare the guideline for active sharing.

Permission on active sharing of spectrum is not being issued at the moment in order to verify the feasibility of sharing an active infrastructure first. Apart from the spectrum, all other frameworks can be shared. Under this, mobile phone tower (BTS), equipment required to receive and deliver calls and for data transfer, such as Node B, Node E, antenna, feeder cable, RAN and microwave radio equipment, will be permitted to be shared.

BTRC is also considering to allow Distributed Antenna System (DAS) from the active components separately, among the operators, considering the demand of the industry. BTRC is considering to allow active sharing in case to case and phase by phase basis, redefine the definition of active infrastructure and scrutinizing all active components for all stakeholders. Consultation process with every layer from the value chain of the industry is still in process [from submarine cable / ITC operators to mobile operators]

2.2.3 European Union

Sharing is a feature in many European mobile markets and is often but not always concluded on a voluntary basis (i.e. “commercially driven”), and not as a result of regulatory intervention. In some of the countries where mobile infrastructure sharing is already a factor in the market or under active consideration, National Rental Affordability Scheme (NRAS) have adopted guidelines trying to achieve a reasonable balance between incentivizing investment and ensuring a fair and competitive market development through infrastructure-based competition.

There are also differences in terms of providing guidelines or rules with respect to infrastructure sharing with some countries providing detailed guidelines and some providing none at all.

There is some degree of passive infrastructure sharing, but the ways in which infrastructure sharing is managed or assessed differs from country to country. Differences arise from how information about infrastructure sharing agreements is treated and shared between the parties and the authorities and how disputes are dealt with. There are also differences in the approaches regarding the inclusion of rules in spectrum awards that may foster, mandate or prohibit network sharing.

In Denmark, an active sharing agreement on Radio Access Network (RAN) is seen to work fine, although the parties involved are in fierce competition. In France, also RAN sharing is efficient and resulted in better 2G / 3G coverage, as it was a prerequisite for authorization, as defined in the NRA sharing guidelines. Furthermore, Norway describes infrastructure sharing as a prerequisite for newcomers to enter the mobile retail market.

With a view to the 5G rollout, it is expected that a much larger amount of sites will be needed. As the amount of sites increases, also the number of sharing agreements is expected to increase or at least the complexity of such agreements to become higher.

Operators are obliged to publish information on passive infrastructure sharing opportunities in advance, in a public forum, in nine countries (Belgium, Bulgaria, Croatia, Greece, Italy, Latvia, Liechtenstein, Montenegro and Serbia). In Norway, the obligation applies only to the SMP operator. The obligations can take the form of online publication, notifying the NRA / Ministry or publication via a third party platform.

2.2.4 United Kingdom

Ofcom has powers under the Communications Act 2003 to impose access conditions on electronic communications networks, as well as powers to impose specific access conditions where it finds a provider has significant market power (SMP), known as SMP conditions. The most common form of infrastructure sharing used to deploy telecoms networks in the UK is regulated access to Openreach’s passive infrastructure network. At regular intervals, Ofcom conducts reviews of telecoms markets to determine how competitive they are. If it finds that an operator has SMP in one of these markets, it can impose SMP obligations or conditions on that specific operator to address this. There are two providers in the UK with SMP, Openreach and KCOM. Openreach has a near ubiquitous network across the UK excluding the Hull area, where KCOM has SMP.

Ofcom issued Access to Infrastructure (ATI) Regulations 2016, enable sharing of information about access to physical infrastructure (e.g. ducts and poles) across utility, transport and

communications sectors, including the exchange of information about existing infrastructure, and the right to access that infrastructure on fair and reasonable terms and conditions. Under the ATI Regulations, network providers and infrastructure owners to make commercial arrangements to grant access to their passive infrastructure and publish reference offers, publicly available documents that would set out the terms under which access would be granted to their networks. Under the ATI Regulations, a network provider can request information about another operator's physical infrastructure and can submit requests to undertake a survey of that infrastructure. Network operators are also required to give access to their physical infrastructure, including access to in-building physical infrastructure, on fair and reasonable terms and conditions. Further, the ATI Regulations require enhanced transparency of civil engineering works and reasonable coordination of works which use public funds.

There are a number of grounds upon which a network operator can refuse requests under the ATI Regulations. For instance, requests can be refused if:

- They are likely to be prejudicial to national security or to put the security or integrity of a network, or public safety or health at risk
- They are not reasonable or are technically unsuitable
- There is not sufficient space, also taking account of the host operator's future needs
- Granting them would breach confidentiality to a third party, or where a telecoms network would seriously interfere with the provision of other services.

Requests to coordinate civil works can also be refused if they have not been made early enough, and if they would impede the infrastructure operator's control over its works or give rise to additional costs.

In case of disputes, Ofcom has powers to include the terms of transactions and impose rights and obligations on the parties to a dispute. The regulations require Ofcom to make a decision about disputes relating to access to physical infrastructure within four months, and to issue a decision on any other dispute within two months. However, this is purely a dispute resolution regime. Ofcom does not have any powers to impose financial penalties under the ATI Regulations. Ofcom's decisions can be appealed to the Competition Appeals Tribunal. To date, Ofcom has not received any formal dispute cases under the ATI Regulations. 5

3 Pakistan's Existing Regime

In Pakistan, Cellular Policy 2004 encouraged passive infrastructure sharing and the license conditions were supportive of passive sharing. Passive Sharing is in practice, since, 2010 after issuance of Standard Operating Procedure (SOP) by PTA and all Cellular Operators signed a MOU with PTA in 2010. The purpose of signing MOU was to increase the Tenancy Ratio to 1.5 by 2013. PTA would facilitate processing of Infrastructure Sharing cases to the extent possible within its jurisdiction. Each operator jointly with other industry players would put in efforts to make commercial arrangements and strive to take up its own and overall industry's tenancy ratio to a

level of 1.5 within next 3 years provided that the arrangement is feasible for the operator(s). Tenancy ratio means number of operators sharing one tower. If a tower is used by more than one operator it would improve Tenancy Ratio hence decreasing the number of towers installed across the country. If the Ratio increases to 1.5, it would mean that 50 out of every 100 towers are being shared by operators.

Other operators including Long Distance International (LDI), Local Loop (LL), Wireless Local Loop (WLL) can also share and lease out their infrastructure through mutual commercial agreements. Some of the relevant sections in terms of sharing of infrastructure, network facilities and services, as provided in above mentioned license categories are reproduced for reference as below:

3.1 Cellular Mobile Operators

Section 2.6.1: *“The Licensee is required to share its existing and future infrastructure with other NGMS Licensees as a matter of first priority. As a minimum, the infrastructure to be shared shall be: site sharing and mast sharing. Licensees may enter into commercial arrangement with each other for active sharing, however, such arrangement shall not take effect till such time the GoP policy is in place and subject to the formal approval and comprehensive framework of PTA. The precise commercial structure of any bilateral or multilateral infrastructure sharing is to be agreed between the Operators involved and then presented to PTA for approval. If no such agreement can be reached after negotiation in good faith by the Licensee and the Operator, then the parties will resolve the matter through mediation and/or arbitration process for an early resolution of the dispute.”*

Section 2.8.1 *“The Licensee is free to negotiate a commercial arrangement with one or more Operators for national roaming. The Licensee may seek negotiations to enter into an agreement to purchase national roaming from another Operator so that the Licensee can provide national GSM, GPRS / EDGE and other services if any. If no such agreement can be reached after negotiation in good faith by the Licensee and the Operator, then the parties will resolve the matter through mediation and/or arbitration process for an early resolution of the dispute.”*

3.2 Long Distance International Operators

Section 2.3.1 *“If the Authority determines, pursuant to the Rules, that a Licensee possesses SMP in a relevant market, the Licensee shall comply with orders of the Authority that are intended to promote competition in respect of that relevant market or markets ancillary thereto, including without limitation orders to provide access to its ducts, poles, towers, space and collocation in switching centers or other similar facilities for use by other Operators.”*

Moreover, LDI licensees can fulfill their roll out obligations by having a lease arrangement of transmission facilities with other operators (licensees) under respective license conditions.

3.3 Wireless Local Loop & Local Loop Operators

Section 2.2.1 *“If the Authority determines, pursuant to the Rules, that a Licensee possesses SMP in a relevant market, the Licensee shall comply with orders of the Authority that are intended to promote competition in respect of that relevant market or markets ancillary thereto, including without limitation orders to:*

- (a) provide access to its ducts, poles, towers, space and co-location in switching centres or other similar facilities for use by other Operators, or*
- (b) make available to its customers, indirect access (carrier selection) to Long Distance And International Public Voice Telephone Services provided by other Operators.”*

3.4 Telecom Infrastructure Provider and Telecom Tower Provider

Scope of TIP License – Section 1.1: *“1.1.1 This License authorizes the licensee to establish and maintain the following Telecom Infrastructure Facilities in Pakistan to lease, rent out or sell end to end links to Telecom Operators licensed by Authority on mutually agreed terms strictly keeping in view their license conditions:*

- (a) Earth stations & Satellite Hub;*
- (b) Optic fiber cables;*
- (c) Radio communications links;*
- (d) Submarine cable landing station within fifteen miles of costal area of Pakistan subject to approval by the Authority & clearance of Ministry of Defence and Ministry of Interior;*
- (e) Towers, poles, ducts and pits used in conjunction with other infrastructure facilities; and*
- (f) Such other Telecommunication infrastructure as the Authority may, by Regulation, require.*

1.1.2 The licensee shall not provide any telecommunication/ broadcasting service.”

Scope of TTP License – Section 1.1: *“1.1.1 This license authorizes a firm/ person to establish and maintain the following Telecom Infrastructure Facilities to lease, rent out or sell to Telecom Operators licensed/ registered by the Authority on mutually agreed terms strictly keeping in view their license/ license conditions:*

- (a) Telecommunication Towers,*
- (b) Such other Telecommunication infrastructure as the Authority may, by Regulation, require.*

1.1.2 Acquisition of Telecommunication Towers shall also be considered as their establishment.

1.1.3 The Licensee shall not provide any telecommunication service.”

As per the rights and scope of TIP licensees, they can establish/install Telecom Infrastructure facilities in accordance with license conditions and as given in Article-I, Article-II and Article-III of the TIP license. Such Telecom Infrastructure includes both Active and Passive elements of telecom infrastructures, however, such telecom infrastructure facilities shall be provided to other licensed operators through a Facility Provision Agreement (FPA) in accordance with Article-VII of the TIP license. There may be Active components involved in Telecom Infrastructure facilities for example, establishing/installing a transmission/transport system which may involve a DWDM/SDH systems etc. or IP backbone components comprising of Layer2/Layer3 switching/router elements along with fiber back haul. Such Active components shall only be energized by authorized service provider licensees such as licensed CMO, LDI/LL/WLL etc.

TTP licensees as per their license scope can only provide Passive Telecom infrastructure such as tower/mast without radio system, space, power system including Gen set etc.

3.5 Telecom Policy 2015 Infrastructure Sharing

Section 7.5.1: *“To implement cost savings in the telecoms industry and to mitigate the delays incurred in procuring rights of way for new infrastructure, reducing environmental impact, sharing of passive and active infrastructure will be considered before granting a new right of way or space to build towers or for other infrastructure. All licensees may share infrastructure on mutually agreed commercial terms. All licensees with significant market power in a relevant market are obliged to share infrastructure on fair and non-discriminatory terms where practical. To this end, PTA will develop the necessary regulations or amendments to license conditions, codes of conduct and model contracts, subject to consultation with stakeholders, and arbitrate between licensees in disputes over infrastructure sharing. Infrastructure sharing obligations encompass a requirement to lease facilities on a fair and non-discriminatory basis to other licensed service providers. The facilities provided include space, electrical power, air conditioning, security, cable ducts, space on antenna and towers etc.”*

Section 7.5.2: *“Infrastructure sharing (passive and active) will be provided based on the regulations and guidelines established by PTA, in consultation with Federal Government (MoIT&T), on the principles of neutrality, non-discrimination and equal access. The guidelines will take account of established international best practices.”*

National roaming

7.6.1 *In the interest of quick rollout of services and to achieve the objectives related to provision of universal service, national roaming will be encouraged in accordance with mobile license terms. Mobile licensees will be encouraged to offer nationwide service as expeditiously as possible at mutually acceptable terms.*

7.6.2 *Licensees that are designated as SMP in a relevant market under the Competition Rules will be required to introduce national roaming on a fair and non-discriminatory basis.”*

4 Objectives of Infrastructure Sharing

The objectives of Infrastructure sharing guidelines is intended to reduce the cost and increase the speed of telecom network and services deployment. These guidelines will provide a regulatory mechanism for promoting and encouraging sharing of Telecom infrastructure that includes both active and passive elements of telecom infrastructure.

For the purpose of this document, it is important to mention that Infrastructure sharing may be allowed between Licensed Operators. Infrastructure sharing between licensed operators and owners of utility infrastructure such as NTDC, DISCOs, PEMRA, WAPDA, SNGPL/SSGPL etc. is not included in these guidelines. PTA is in process of hiring a consultant to deliberate with stakeholders, including owners of Utility Infrastructure, for use of utility infrastructure for telecom operators. A separate guideline may be issued as a result of consultation, once concluded, with stakeholders of such utility infrastructure owners.

5 Draft Guidelines

The scope of these guideline is to provide a mechanism for licensed operators to share Infrastructure that include Active as well as Passive Telecom Infrastructure facilities. For the purpose of these guidelines, radio spectrum sharing, radio spectrum trading or leasing and infrastructure owned by utility service providers are out of scope of this document. Use of infrastructure owned by utility service providers and radio spectrum sharing, radio spectrum trading/leasing will be provided through separate regulatory framework/guidelines, accordingly.

1. These guidelines are applicable to all Telecommunication Services Providers (TSP) and Telecom Infrastructure operators (TIP/TTP) licensed by Pakistan Telecommunication Authority.
2. Active Infrastructure means electronic components/elements of “Telecommunication System” that may comprise of active components – energized network elements – embodied in mobile and fixed networks, core and access nodes, operational support system (OSS), business support system (BSS) and elements involved in management of transport network including fiber and radio access network elements etc.
3. Passive Infrastructure means non-electronic infrastructure such as physical sites, buildings, premises, tower/masts, power supply (including battery, diesel gen set or any alternate power supply), air-conditioning etc. For the purpose of this document/guidelines it excludes cable ducts/utility corridors owned by non-licensed telecom operators or other utility infrastructure owners.
4. TSP licensees (CMO, WLL/LL, LDI) which own a telecom infrastructure, may share their active as well as passive infrastructure with other TSP licensees on mutually agreed commercial terms subject to prior approval by the Authority. Authorized TSP licensees include Cellular Mobile Operators, Long Distance International, Local loop, Wireless local loop operators or any other category of TSP duly authorized/licensed by the Authority, to provide telecom services, from time to time.

5. TIP and TTP licensees are not telecom services providers (TSP) licensees. TIP and TTP are rather telecom infrastructure facilities providers duly licensed by Authority to provide their telecom infrastructure facilities to telecom service providers through a Facility Provision Agreement (FPA) duly approved/authorized by the Authority.
6. TIP licensees will be allowed to provide active elements/components of their telecom infrastructure facilities to authorized telecom service provider licensees in such a manner that active elements/components of TIP licensees shall be **energized/activated only** for conveyance of telecom services/or conveyance of intelligence by TSP licensees.
7. In continuation to guideline provided in clause 6, it is to further clarify that the infrastructure facilities provider licensees (TIP/TTP), shall not offer commercial services by themselves through deployment of radio frequency spectrum. It shall be the responsibility of licensed telecom service providers (TSPs), which hold the rights to spectrum, to offer commercial services by using the facilities shared by infrastructure licensees.
8. In a situation where active infrastructure is provided by a TIP to a TSP licensee, both licensees (parties) shall ensure compliance to license obligations pertaining to service provision to end user, QoS requirements, roll out and environmental obligations, lawful intercept arrangements and compliance to all applicable laws through FPA or amendment in respective licenses, if required.
9. Similarly, infrastructure sharing arrangement between TSPs (CMO, WLL/LL, LDI) licensees, both licensees (parties) shall ensure compliance to licensed obligations pertaining to service provision to end users, QoS requirements, roll out and environmental obligations, lawful intercept arrangements and compliance to all applicable laws. Such arrangements may require amendments in respective licenses, if required.
10. Necessary amendments in respective licenses, if required to allow active infrastructure sharing, may be made with mutual consent of licensees in accordance with section 22 of Pakistan Telecommunication Re-Organization Act, 1996 (Amended 2006).
11. There is a high demand of seamless and quality network connectivity inside the large public places / commercial complexes / residential buildings. In such buildings / premises CMOs may not have a business case to deploy and maintain its own In-building System (IBS) but telecom infrastructure owned by a TSP or TIP is available, CMOs may enter into a sharing agreement with TSP / TIP on mutually agreed commercial basis through a FPA duly approved by the Authority.
12. Authority will evaluate such infrastructure sharing agreements / proposals keeping in view competition concerns to allow/approve such sharing agreements. Authority may examine different competition aspects in terms of efficiencies versus competitive harm and considering market conditions.
13. Infrastructure sharing has potential risks for the sharing parties and the regulatory bodies (PTA, CCP, etc.). It is the responsibility of the sharing entities to undertake their own risk analysis before considering to enter into such agreement(s). Such detailed business case and risk analysis and probable mitigation plan/tools shall be provided to Authority as a part of Infrastructure sharing application which may be evaluated by Authority as a part of their business case approval process.

14. Agreement or contract, which results in exclusive access or lessening of competition will not be allowed. Indulgence into such a practice, through either formal or informal arrangement, may be treated as violation of these guidelines.
15. National roaming is also considered to be an example of active infrastructure sharing. However, national roaming is out of scope of this document / guideline, PTA may issue a separate guideline / enabling framework for infrastructure sharing through national roaming arrangement.
16. Interested sharing parties, both TSP and TIP/TTP, shall maintain infrastructure sharing Database / Atlas with Authority which will be accessible to PTA licensees only. The database shall include available capacities of Active and Passive infrastructure elements, physical space, site geographical locations etc.
17. The interested licensed parties shall make available, Code of Commercial Practices, Model Contracts and Reference Offers against Active and Passive infrastructure. Such information shall be made available with PTA which should be accessible to PTA licensees.
18. Inter-operator payments and allowable deduction from annual regulatory dues claimed by relevant licensees will be dealt in a systematic manner for which PTA may issue standards / regulatory arrangement / determination. Interested Infrastructure sharing licensees shall clearly highlight such payments made in respective financial statements that can be clearly mapped / understood between both licensed operators for the mentioned fiscal year. For the sake of simplification, payment made by “licensee A” would become revenue of “licensee B”.

6 Acronyms

ADM	Add-drop multiplexer
BSC	Base Station Controller
BSS	Business support system
BTS	Base Transceiver Station
CAPEX	Capital expenditures
CMOs	Cellular Mobiles Operators
DISCOs	Distribution Company
DWDM	Dense Wavelength Division Multiplexing
FPA	Facility Provision Agreement
GWCN	Gateway Core Network
ICT	Information and communication services
ISP	In Side Plant
LDI	Long Distance and International
LL	Local Loop
LLU	Local Loop Unbundling
MNO	Mobile Network Operators
MOCN	Multi-Operator Core Network

MORAN	Multi-Operator RAN
MSC	Mobile Switching Station
MVNO	Mobile Virtual Network Operator
NRAs	National Rental Affordability Scheme
NTDC	National Transmission & Dispatch Company
OAN	Open Access Network
OPEX	Operating expenses
OSP	Out Side Plant
OSS	Operational support system
PEMRA	Pakistan Electronic Media Regulatory Authority
RAN	Radio Access Network
RNC	Radio Network Controller
SNGPL	Sui Northern Gas Pipelines Limited
SSGPL	Sui Southern Gas Pipelines Limited
TIP	Telecom Infrastructure Provider
TSP	Telecom Service Providers
TTP	Telecom Tower Provider
VAS	Value Add Services
WAPDA	Pakistan Water & Power Development Authority
WLL	Wireless Local Loop
xDSL	x Digital Subscriber Line

7 References

1. ICT and Broadcasting Infrastructure Sharing Guidelines, International Telecommunications Union (ITU), 21st Feb 2016.
2. BEREC Report on infrastructure sharing, BoR (18) 116, 14 June, 2018
3. Infrastructure Sharing: An Overview by GSMA, June 18, 2019
4. Accelerating Digital Connectivity Through Infrastructure Sharing, Davide Strusani and Georges V. Hounbonon, February 2020.
5. Policy paper, Review of the Access to Infrastructure Regulations - call for evidence, Published 12 June 2020

8 Feedback and Comments

Comments, suggestions and views from the industry and the general public, may be submitted through following channels.

- Postal address: Director General Strategy and Development, PTA HQs, F-5/1, Islamabad.
- Email address: imad@pta.gov.pk & ehsan@pta.gov.pk

This consultation will be opened for a period of four (04) weeks, and will close by 12 noon on 30th November 2020.

PTA assures that stakeholders' comments would be duly analyzed and considered, if deemed appropriate, while finalizing the Infrastructure Sharing Guidelines.